

TO THE CLAIMS:

1. (Currently amended) An invert emulsion drilling fluid comprising
an oleaginous continuous phase
a non-oleaginous discontinuous phase
a surfactant selected from polyglyceryl-2 diisostearate or polyglyceryl-3 diisostearate is a fatty acid ester of diglycerol or triglycerol, and
a weighting agent.
2. (Cancelled)
3. (Canceled)
4. (Currently amended) The drilling fluid of claim 1 wherein the oleaginous fluid is selected from diesel oil, mineral oil, synthetic oil, ester oils, glycerides of fatty acids, aliphatic esters, aliphatic ethers, aliphatic acetals, or other such hydrocarbons and combinations thereof.
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5. (Original) The drilling fluid of claim 1 wherein the non-oleaginous phase is selected from fresh water, sea water, brine, aqueous solutions containing water soluble organic salts, water soluble alcohols or water soluble glycols or combinations thereof.
6. (Original) The drilling fluid of claim 1 wherein the weighting agent is a water soluble weighting agent or a water insoluble weighting agent or combinations thereof.
7. (Original) The drilling fluid of claim 6 wherein the water insoluble weighting agent is selected from barite, calcite, mullite, gallena, manganese oxides, iron oxides, or combinations thereof.
8. (Original) The drilling fluid of claim 6 wherein the water soluble weighting agent is selected from water soluble salts of zinc, iron, barium, calcium or combinations thereof.

9. (Currently amended) The drilling fluid of claim 1 An invert emulsion drilling fluid comprising

an oleaginous continuous phase

a non-oleaginous discontinuous phase

a surfactant is a fatty acid ester of diglycerol or triglycerol, and

a weighting agent wherein the surfactant is selected from polyglyceryl-2 diisostearate or polyglyceryl-3 diisostearate.

10. (Cancelled)

11. (Currently amended) The drilling fluid of claim 10 An invert emulsion drilling fluid comprising

an oleaginous continuous phase

a non-oleaginous discontinuous phase,

a biodegradable surfactant including a di-fatty acid ester of diglycerol and wherein fatty acid has the formula RCO₂H in which R is an alkyl or alkenyl having 10 to 20 carbon atoms, and

a weighting agent wherein the surfactant is polyglyceryl-2 diisostearate.

12. (Cancelled)

13. (Original) The drilling fluid of claim 12 An invert emulsion drilling fluid comprising

an oleaginous continuous phase

a non-oleaginous discontinuous phase,

a biodegradable surfactant including a di-fatty acid ester of triglycerol and wherein fatty acid has the formula RCO₂H in which R is an alkyl or alkenyl having 10 to 20 carbon atoms, and

a weighting agent wherein the surfactant is polyglyceryl-3 diisostearate.

14. (Currently amended) A method of formulating an invert emulsion drilling fluid, said method comprising:

mixing an oleaginous fluid, a non-oleaginous fluid, a biodegradable surfactant and a weighting agent, wherein the biodegradable surfactant is selected from polyglyceryl-2 diisostearate or polyglyceryl-3 diisostearate in amounts sufficient to form an invert emulsion in which the oleaginous fluid is the continuous phase and the non-oleaginous fluid is the discontinuous phase.

15. (Cancelled)

16. (Cancelled)

Q, 0 17. (Currently amended) The method of claim 13 14 wherein the oleaginous fluid is selected from diesel oil, mineral oil, synthetic oil, ester oils, glycerides of fatty acids, aliphatic esters, aliphatic ethers, aliphatic acetals, ~~or other such hydrocarbons~~ and combinations thereof.

18. (Currently amended) The method of claim 13 14 wherein the non-oleaginous phase is selected from fresh water, sea water, brine, aqueous solutions containing water soluble organic salts, water soluble alcohols or water soluble glycols or combinations thereof.

19. (Currently amended) The method of claim 13 14 wherein the weighting agent is a water soluble weighting agent or a water insoluble weighting agent or combinations thereof.

20. (Currently amended) The method of claim 18 19 wherein the water insoluble weighting agent is selected from barite, calcite, mullite, gallena, manganese oxides, iron oxides, or combinations thereof.

21. (Currently amended) The method of claim 18 19 wherein the water soluble weighting agent is selected from water soluble salts of zinc, iron, barium, calcium or combinations thereof.

22. (Currently amended) A method of drilling a subterranean hole with an invert emulsion drilling fluid, said method comprising:

mixing an oleaginous fluid, a non-oleaginous fluid, a biodegradable surfactant, and a weighting agent to form an invert emulsion, wherein the biodegradable surfactant is selected from polyglyceryl-2 diisostearate or polyglyceryl-3 diisostearate and wherein the biodegradable surfactant is in amounts sufficient to form an invert emulsion in which the oleaginous fluid is the continuous phase and the non-oleaginous fluid is the discontinuous phase, and

drilling said subterranean hole using said invert emulsion as the drilling fluid.

23. (Cancelled)

24. (Cancelled)

25. (Currently amended) The method of claim 20 22 wherein the oleaginous fluid is selected from diesel oil, mineral oil, synthetic oil, ester oils, glycerides of fatty acids, aliphatic esters, aliphatic ethers, aliphatic acetals, ~~or other such hydrocarbons~~ and combinations thereof.

26. (Currently amended) The method of claim 20 22 wherein the non-oleaginous phase is selected from fresh water, sea water, brine, aqueous solutions containing water soluble organic salts, water soluble alcohols or water soluble glycols or combinations thereof.

27. (Currently amended) The method of claim 20 22 wherein the weighting agent is a water soluble weighting agent or a water insoluble weighting agent or combinations thereof.

28. (Currently amended) The method of claim 26 27 wherein the water insoluble weighting agent is selected from barite, calcite, mullite, gallena, manganese oxides, iron oxides, or combinations thereof.

29. (Currently amended) The method of claim 26 27 wherein the water soluble weighting agent is selected from water soluble salts of zinc, iron, barium, calcium or combinations thereof.

30. (Currently amended) A method of drilling a subterranean well with an invert emulsion drilling fluid, said method comprising:

mixing an oleaginous fluid, a non-oleaginous fluid, a biodegradable surfactant, and a weighting agent to form an invert emulsion, wherein the biodegradable surfactant is selected from polyglyceryl-2 diisostearate or polyglyceryl-3 diisostearate and wherein the biodegradable surfactant is in amounts sufficient to form an invert emulsion in which the oleaginous fluid is the continuous phase and the non-oleaginous fluid is the discontinuous phase,

circulating said invert emulsion within said subterranean well and

drilling said subterranean well using said invert emulsion as the drilling fluid.

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31. (Cancelled)

Cancelled
32. (Cancelled) The method of claim 30 A method of drilling a subterranean well with an invert emulsion drilling fluid, said method comprising:

mixing an oleaginous fluid, a non-oleaginous fluid, a biodegradable surfactant, and a weighting agent to form an invert emulsion, wherein the biodegradable surfactant includes a fatty acid ester of diglycerol, wherein the fatty acid has the formula RCO₂H in which R is an alkyl or alkenyl having 10 to 20 carbon atoms and wherein the biodegradable surfactant is in amounts sufficient to form an invert emulsion in which the oleaginous fluid is the continuous phase and the non-oleaginous fluid is the discontinuous phase,

circulating said invert emulsion within said subterranean well and
drilling said subterranean well using said invert emulsion as the drilling fluid wherein the fatty acid ester of diglycerol is a di fatty acid ester and wherein the fatty acid ester of diglycerol is polyglyceryl-2 diisostearate.

33. (Cancelled)

34. (Cancelled)

35. (Currently amended) The method of claim 32 A method of drilling a subterranean well with an invert emulsion drilling fluid, said method comprising:

mixing an oleaginous fluid, a non-oleaginous fluid, a biodegradable surfactant, and a weighting agent to form an invert emulsion, wherein the biodegradable surfactant includes a fatty acid ester of triglycerol, wherein the fatty acid has the formula RCO_2H in which R is an alkyl or alkenyl having 10 to 20 carbon atoms and wherein the biodegradable surfactant is in amounts sufficient to form an invert emulsion in which the oleaginous fluid is the continuous phase and the non-oleaginous fluid is the discontinuous phase,

circulating said invert emulsion within said subterranean well and drilling said subterranean well using said invert emulsion as the drilling fluid wherein the fatty acid ester of triglycerol is a di-fatty acid ester and wherein the fatty acid ester of triglycerol is polyglyceryl-3 diisostearate.